



BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: **A. DAVID
ERPELDING**

Serial No.: **09/939,074**

Filed: **24 AUGUST 2001**

For: **BALANCED AND DAMPED
SUSPENSION FOR USE IN A DISK
DRIVE**

§ Attorney Docket No.: **SJO920010018US1**
§
§
§ Examiner: **MARK S. BLOUIN**
§
§ Confirmation No.: **4237**
§
§ Art Unit: **2653**
§
§

SECOND APPEAL BRIEF

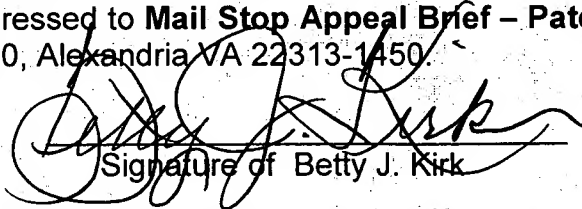
Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This Brief is submitted in triplicate in support of the Notice of Appeal, mailed on October 13, 2005, in the above-referenced application.

**CERTIFICATE OF MAILING
37 CFR 1.8(A)**

I hereby certify that this correspondence is, on the date shown below, being deposited with the United States Postal Service as First Class Mail in an envelope addressed to **Mail Stop Appeal Brief - Patents**, Commissioner of Patents, P.O. Box 1450, Alexandria VA 22313-1450.


Signature of Betty J. Kirk

October 13, 2005
Date

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REAL PARTY IN INTEREST

The Real Party in Interest in the present Appeal is International Business Machines Corporation, the assignee, as evidenced by the assignment set forth at Reel 012130, Frame 0649.

RELATED APPEALS AND INTERFERENCES

No related appeals or interferences are known to Appellant, Appellant's legal representative, or assignee which will directly affect, or be directly affected by, or have a bearing on the Board's decision in the present Appeal.

STATUS OF THE CLAIMS

Claims 1 – 12 stand finally rejected by the Examiner as noted in the Final Office Action dated August 23, 2005, and are on appeal.

STATUS OF THE AMENDMENTS

No amendment was submitted subsequent to the Final Office Action.

SUMMARY OF CLAIMED SUBJECT MATTER

As shown in Figures 4c and 4d, Appellant's invention comprises a disk drive suspension having optimal sag. Page 6, lines 19 – 20. Optimal sag is achieved by having vertical alignment between the torsional axis 405 of the suspension and the pivot point 407 of the slider 404. Page 4, lines 24 – 25. In other words, the torsional axis is adjusted to concentrically "pass through" the pivot point 407. Page 17, line 15. As explained in the present application, a mismatch between the torsional axis and the pivot point (either positive (Figures 4a and 4b) or negative (Figures 4e and 4f)) causes excess track misregistration (TMR). Page 4, lines 15-20; and page 5, lines 1-4.

GROUND OF REJECTION TO BE REVIEWED ON APPEAL

The Examiner finally rejected Claims 1, 2, 7, and 8 under 35 U.S.C. § 102(e) as being anticipated by *Larson*. Under 35 U.S.C. § 103(a), the Examiner stated that Claims 5, 6, 11, and 12 are unpatentable over *Larson* in view of *Blaeser*, and that Claims 3, 4, 9, and 10 are unpatentable over *Larson* in view of *Manzke*. Final Office Action, paragraphs 2, 6, and 8.

ARGUMENT

The *Larson* Reference

The cited primary reference, *Larson*, focuses on what it calls a "water slide" configuration. See title. The term "water slide" refers to the ramp-like shape of the supporting member 322 that vertically offsets the lift tab 304, as shown in Figures 3B and 4. Applicant respectfully asserts that *Larson's* geometry is the same as that shown in Applicant's Figure 4a, at element 402. As explained in Applicant's specification (page 4, lines 3-14), this geometry results in positive sag. Moreover, *Larson* does not contain the terms "torsion" or "pivot" because, unlike Applicant's invention, it is not concerned with torsional axes and pivot points. Rather, *Larson* is concerned with the distance between the head/ramp and the disk. Col. 2, lines 50-63; Col. 7, lines 2-7.

The Examiner states that *Larson's* torsional axis is the "longitudinal centerline of load beam." Page 2, paragraph 3. However, the terms "torsion", "torsional", and "pivot" never appear in *Larson*. The Examiner also states that, "the torsional axis approximately passing through the pivot point (Col 6, lines 26-29)". Page 2, paragraph 3. However, that passage in *Larson* actually states, "a dimple 356 for allowing the magnetic head to gimbal over the dimple to conform over a disk recording surface." Even if one assumes that the dimple 356 is the pivot point, and that "to gimbal" is equivalent to defining a torsional axis (there is no support for either proposition), *Larson* only states that the head is allowed to "gimbal over the dimple." This is a completely different statement than "a torsional axis passing through a pivot point," as required by Applicant's invention.

The *Blaeser* Reference

The Examiner cites *Blaeser* for the proposition that it discloses a constrained damping layer. Final Office Action, paragraph 7. However, like *Larson*, the term "torsion" does not appear anywhere in the specification of *Blaeser*. Thus, the combination with *Blaeser* still does not address the issue of torsional balance since the term nor any equivalents of the term are not mentioned in the patent.

The *Manzke* Reference

The Examiner cites *Manzke's* column 3, lines 4 – 5 for the proposition that the load beam is formed of magnesium or a magnesium rich alloy. Final Office Action, paragraph 9. However, those materials are specified for "Beam section 9 and head tower 10," not the load beam. Column 3, lines 1 – 2. Careful comparison of the 1980's architecture of *Manzke* to modern designs reveals that beam section 9 and head tower 10 are equivalent to today's actuator arm and mount plate. Importantly, the "hinge" of *Manzke* (web 22 in Figure 1B) is located at mounting means 16, its equivalent "load beam" is distal to the hinge at head unit 7, and it is mounted to the head tower 10 with screws 18. Defining these equivalents is critical because the materials specification used by the Examiner relies on the opposite interpretation. Appellant maintains that magnesium is only specified for the arm and mount plate (i.e., beam section 9 and head tower 10), but not for the load beam (i.e., head unit 7). Thus, *Manzke* cannot be used to reject Appellant's claims as relied upon by the Examiner.

Arguments for Claims 1, 2, 5-8, 11, and 12

Each of the two independent claims (Claims 1 and 7) require, "said torsional axis approximately passing through said pivot point." Since *Larson* does not mention the terms torsion or pivot, it is impossible to support the assertion that *Larson* anticipates Claims 1 and 7. The geometry of *Larson* (specifically Figure 4) bears a strong resemblance to Applicant's Figure 4A, which renders undesirable "positive sag" as explained above. Appellant maintains that Appellant's Figure 4A and *Larson's* Figure 4 are equivalent. Furthermore, no pivot point for a head gimbal is established in *Larson*. Without a pivot point, one cannot then state that another undefined element (i.e., the torsional axis) "passes through" the pivot point. Claims 1, 7, and all of their dependent claims are clearly allowable over *Larson*.

Arguments for Claims 3, 4, 9, and 10

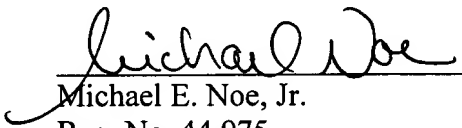
Dependent Claims 3, 4, 9, and 10 address the material content of the load beam. The Examiner has mischaracterized *Manzke* to stand for the propositions contained in those claims. Although *Manzke* specifies some materials for its actuator arm and mount plate (i.e., beam section 9 and head tower 10), it is silent as to the content of its modern-day equivalent load beam

(i.e., head unit 7). Thus, Claims 3, 4, 9, and 10 are patentable over *Larson* in view of *Manzke*.

Conclusion

For all of the foregoing reasons it is respectfully urged that the claims are in condition for allowance and favorable action is requested. Please charge **Hitachi Global Storage Technologies' Deposit Account No. 50-2587** in the amount of **\$500.00** for the Appeal Brief fee. If any additional fees are required, please charge **Hitachi Global Storage Technologies' Deposit Account No. 50-2587**.

Respectfully submitted,



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CLAIMS APPENDIX

1. A suspension for use in a magnetic storage disk drive, comprising:
a hinge member; and,
a load beam having an associated head gimbal pivot point and a torsional axis, wherein said hinge and said load beam are formed separately and subsequently joined together, said torsional axis approximately passing through said pivot point.
2. A suspension load beam as in claim 1 wherein said load beam comprises one or more ribs formed along a portion of said load beam, said ribs are formed such that the distribution of mass of said load beam result in the balance of said total mass about said torsional axis.
3. A suspension load beam as in claim 1 wherein said load beam is formed from magnesium.
4. A suspension load beam as in claim 1 wherein said load beam is formed from a magnesium rich alloy.
5. A suspension as in claim 1 wherein said load beam is formed from a constrained layer damping material.
6. A suspension as in claim 5 wherein said constrained layer damping material comprises a sandwich of two metal layers and a viscoelastic damping material disposed between the two metal layers.

7. A disk drive, comprising:
 - at least one magnetic disk having a recording surface;
 - a motor connected with said disk;
 - a slider with a trailing surface;
 - a magnetic recording head for recording digital data on said recording surface of said disk, said magnetic recording head formed on said trailing surface of said slider;
 - a suspension connected with said slider, said suspension comprising a hinge portion, a load beam portion having a first and second outside edge, said hinge portion and load beam portion being formed separately and joined together, said load beam having a distribution of total mass balanced about a torsional axis, said torsional axis approximately passing through said pivot point;
 - a rigid arm connected with said suspension; and
 - an actuator connected with said rigid arm.
8. A disk drive as in claim 7 wherein said load beam has one or more ribs formed along a portion of said load beam, said ribs are formed such that the distribution of mass of said ribs when combined with the distribution of mass of other portions of said load beam result in the balance of said total mass about said torsional axis.
9. A disk drive as in claim 7 wherein said load beam is formed from magnesium.
10. A disk drive as in claim 7 wherein said load beam is formed from a magnesium rich alloy.
11. A disk drive as in claim 7 wherein said load beam is formed from a constrained layer damping material.
12. A suspension as in claim 11 wherein said constrained layer damping material comprises a sandwich of two metal layers and a viscoelastic damping material disposed between the two metal layers.

EVIDENCE APPENDIX

--NONE--

RELATED PROCEEDINGS APPENDIX

--NONE--